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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,133	01/22/2004	Chris Hutchens	84715	6416

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EXAMINER	
SODERQUIST, ARLEN	
ART UNIT	**PAPER NUMBER**
1797	
MAIL DATE	**DELIVERY MODE**
03/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/763,133	HUTCHENS ET AL.	
	Examiner	Art Unit	
	Arlen Soderquist	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1-2-08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The disclosure is objected to because of the following informalities: the status of the related applications on page 1 needs to be updated.

Appropriate correction is required.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over McDevitt (US 6,649,403) in view of Benech (US 5,867,267), Rakow and Waters. In the patent McDevitt teaches a system for the rapid characterization of multi-analyte fluids, in one embodiment, includes a light source, a sensor array, and a detector. The sensor array is formed from a supporting member into which a plurality of cavities may be formed. A sensing cavity may be formed on the bottom surface of a support substrate. An example of a sensing cavity that may be used is a Fabry-Perot type cavity. Fabry-Perot cavity-based sensors may be used to detect changes in optical path length induced by either a change in the refractive index or a change in physical length of the cavity. Using micromachining techniques, Fabry-Perot sensors may be formed on the bottom surface of the cavity. Figures 4A-F depict a sequence of processing steps for the formation of a cavity and a planar top diaphragm Fabry-Perot sensor on the bottom surface of a silicon based supporting member. The cavity (286) of the Fabry-Perot sensor may be filled with a sensing substrate (290), as depicted in figure 4E. To coat the cavity with a sensing substrate, the sensing substrate may be dissolved in a solvent. A solution of the sensing substrate is applied to the supporting member (260). The solution is believed to rapidly enter the

cavity through the etched windows (266) in the bottom diaphragm (264a), aided in part by capillary action. As the solvent evaporates, a thin film of the sensing substrate coats the inner walls of the cavity, as well as the outer surface of the bottom diaphragm. By repeated treatment of the supporting member with the solution of the sensing substrate, the thickness of the sensing substrate may be varied. The sensing substrate may be configured to produce a signal when a receptor coupled to the substrate interacts with the analyte. Using pattern recognition techniques, the analytes within a multi-analyte fluid may be characterized. McDevitt does not teach the claimed Fabry-Perot cavity structure, the porphyrin or metalloporphyrin sensing substrate or a reference area/zone.

In the patent Benech teaches a sensing device having a transition zone. The transition zone comprises at least two zones, a reference zone (10a) and an interaction zone (10b). The interaction zone (10b) is formed by depositing a substrate whose optical coefficient, or thickness, is sensitive to the medium to be studied. The light beam is divided into a reference beam passing through the reference zone (10a) and a measurement beam passing through the interaction zone (10b). The measurement and reference beams are used to measure the medium. Such a device is used to achieve sensors for applications in physics, chemistry and biology.

In the paper Rakow teaches a colorimetric sensor array for odor visualization. Array-based vapor-sensing devices are used to detect and differentiate between chemically diverse analytes. These systems -- based on cross-responsive sensor elements -- aim to mimic the mammalian olfactory system by producing composite responses unique to each odorant. Previous work concentrated on a variety of non-specific chemical interactions to detect non-coordinating organic vapors. But the most odoriferous, toxic compounds often bind readily to metal ions. They report a simple optical chemical sensing method that utilizes the color change induced in an array of metalloporphyrin dyes upon ligand binding while minimizing the need for extensive signal transduction hardware. The chemoselective response of a library of immobilized vapor-sensing metalloporphyrin dyes permits the visual identification of a wide range of ligating (alcohols, amines, ethers, phosphines, phosphites, thioethers and thiols) and even weakly ligating (arenes, halocarbons and ketones) vapors. Water vapor does not affect the performance of the device, which shows a good linear response to single analytes, and interpretable responses to analyte mixtures. Unique color fingerprints can be obtained at analyte

concentrations below 2 ppm, and responses to below 100 ppb have been observed. They teach that this type of sensing array will be of practical importance for general-purpose vapor dosimeters and analyte-specific detectors (for insecticides, drugs or neurotoxins, for example).

In the paper Waters teaches a micromechanical optoelectronic switch and amplifier (MIMOSA). The authors report for the 1st time the monolithic integration of a micromechanical modulator (Fabry-Perot cavity) and a p-n photodiode on a Si substrate yielding a versatile optoelectronic device. Because both devices are monolithically integrated on a Si substrate, the combination is compact with minimal parasitic elements. Such a device combination yields a transistor-like element with positive and negative small-signal voltage amplification. The maximum small-signal voltage gain achieved is 500 while the modulated current of the device exhibits a maximum ON-OFF ratio of 3:1. While the theoretical current gain of the device is infinite, a 10-pA noise level limited the measured d.c. current gain to 10G. The first paragraph of the introduction (page 33) teaches that micromechanical voltage tunable modulators are of interest in sensor applications.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a reference zone in addition to the reaction zone as taught by Benech into the McDevitt structure because of its known ability to assist in measuring a medium as taught by Benech. It also would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sensing materials of Rakow into the McDevitt device because of their ability to produce a unique color fingerprint for different analytes as taught by Rakow. It finally would have been obvious to one of ordinary skill in the art at the time the invention was made to form the Fabry-Perot cavity of McDevitt using a process and structure as taught by Waters because of the sensitivity of the device as taught by Waters.

4. Applicant's arguments filed January 2, 2008 have been fully considered but they are not persuasive. First relative to the objection to the specification the status information that has changed (abandoned or patented) needs to be added to the applications listed on page 1. Relative to the art, examiner points to column 16, lines 36-59 of McDevitt. In this section McDevitt teaches that the surfaces of the cavity of the Fabry-Perot type detector are coated with a sensing substrate. The process is one of multiple applications to create a layer of appropriate thickness. Also figures 4D and 4F show the sensitive layer on both parallel surfaces. Thus, McDevitt

clearly teaches the presence of a sensing substrate on the parallel surfaces of the detector contrary to what applicant has argued. The section referred to by applicant directly follows the above section. Thus the section to which applicant has referred is a warning that too much sensing substrate is not good rather than one should not cause a sensing substrate to be formed. It should also be noted that the argument is not commensurate in scope with the claims since there is no designation that the flexibly suspended surface is the upper surface. The claim language is of a scope that the flexibly suspended surface could be either of the upper or lower surfaces. Thus within the teachings of McDevitt there is clearly a teaching of providing a sensing substrate on the surfaces of the Fabry-Perot detector and an expectation that a useful device can be obtained thereby. The teachings of Waters do not change this, but do provide a motivation for using a flexibly suspended surface in the Fabry-Perot chamber of McDevitt.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose telephone number is (571) 272-1265. The examiner can normally be reached on Monday-Thursday and Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Arlen Soderquist/
Primary Examiner, Art Unit 1797